# APPENDIX A

## SUMMARY OF FEASIBLE ALTERNATIVES

# Calabazas Creek - Summary of Feasible Alternatives for Prospect to Saratoga-Sunnyvale (Site 3) part 1

| NFP Objectives | **Alt 3A** (underground RCB bypass) | **Alt 3B** (additional RCB / new double RCB) | **Alt 3C** (floodwall) |
|---|---|---|---|
| **Alternative Description:** | A separate 9-foot by 14-foot underground reinforced concrete box (RCB) would be constructed with a different alignment under the SJNB parking lot from Prospect Road to Saratoga-Sunnyvale Road under San Jose National Bank (SJNB) parking lot. The bypass box would be approximately 755 feet long, with a capacity of half of the 1% design flow. | A 9-foot by 14-foot additional underground reinforced concrete box (RCB) would be constructed along the left side (looking upstream) of the existing underground concrete tunnel with a length of approximately 685 feet from Prospect Road to Saratoga-Sunnyvale Road or the existing tunnel would be replaced by a new 9-feet by 14-feet double RCB. | Upstream of Saratoga-Sunnyvale Road about 400-450 foot channel section would be modified installing a floodwall appproximately 6-feet in height along top of the existing west bank. Saratoga-Sunnyvale existing tunnel will remain the same with pressure flow under the upstream end. |
| **Operation & Maintenance (O&M):** | Operation and maintenance of the underground RCB would be minimal. Although the RCB would be designed with adequate slope to move debris, the inlets would require regular cleaning to remove leaves and other debris during the flow season | Operation and maintenance of the additional RCB or a new double RCB would be minimal. Although the additional RCB or a new double RCB would be designed with adequate slope to move debris, the inlets would require regular cleaning to remove leaves and other debris during the flow season. | Existing O&M activities are expected to continue within the project limits and no additional maintenance activities would be required. Typical maintenance activities include trash and debris removal, vegetation (overgrowth) removal, erosion repair in natural sections, and sediment removal will remain the same and some additional maintenance activities would be required for graffiti removal. |
| **Socio-Cultural Environment:** | | | |
| **(A) Land Ownership/ Access/ Right of way:** | Underground RCB would be constructed on the left side (looking upstream) of existing tunnel on the City of Saratoga and SJNB property. Land acquisition would be necessary from property owners. | Land acquisition would be necessary from property owners, City of Saratoga and SJNB, for this work. | No land acquisition would be necessary from property owners for this work; construction would occur within the existing District rights-of-way. |
| **(B) Aesthetics:** | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. |
| **(C) Recreation Potential:** | None identified | None identified | None identified |
| **Physical Environment:** | | | |
| **(A) Sedimentation** | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. |
| **(B) Water Quality** | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. |
| **(C) Geology and Soils** | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. |
| **Environmental Review:** | | | |
| **(A) Biological Resources** | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. |
| **(B) Cultural Resources** | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. |
| **(D) Public Services, Utilitites and Traffic** | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. |
| **Project Costs:** | | | |
| **Construction Costs** | $4.6 million | $4.0 million / $5.8 milion | $0.4 million |

# Calabazas Creek - Summary of Feasible Alternatives for Prospect to Saratoga-Sunnyvale (Site 3) part 2

| NFP Objectives | **Alt 3D** (swale detention basin) | **Alt 3E** (swale Detention and Culvert Replacement) |
|---|---|---|
| **Alternative Description:** | A large swale approximately 1350 feet long and 65 feet wide runs parallel to Calabazas Creek from Saratoga-Sunnyvale Road to downstream of UPRR. The average depth of the detention facility would be 0-8 feet deeper than existing depth, producing approximately 9 acre-feet of storage volume. This detention basin would include structures like three weirs and a gate and floodwalls at downsteam end of the swale. The first weir would be built at the upstream end of the swale approximately 210 feet long. The second weir would be built about 400 feet downstream of the first weir approximately 35 feet long. These two weirs would be designed at an elevation so that the swale storage area doesn't collect any creek water until a very large peak flow or storm surge comes down Calabazas Creek. The third weir would be built at the downstream of the swale approximately 45 feet long and a gate with about 1 foot in diameter to release the water back into the creek. | An 80-foot long entrance section of the concrete tunnel will be rebuilt to improve flow efficiency and reduce upstream water depth. The new, enlarged RCB section will be a 10-foot high by 16-foot wide box. This new section will be constructed along the same alignment of the existing tunnel under Saratoga-Sunnyvale Road. An 8-foot long transition will connect the enlarged RCB to the existing tunnel. A 170-foot long overflow weir will be placed on the left bank (looking upstream) of Calabazas Creek to divert any flow above 1,350 cfs into the existing swale. Some openings in the existing swale will be blocked in order to convert the swale into a detention basin of capacity one acre-ft at maximum water surface elevation of 308.6 ft. A drainage pipe, of 1-foot diameter, will connect the detention basin with the creek by crossing the levee. the pipe will drain the detention basin water by discharging it into the creek. The pipe will be placed at Station 533+95 and will have a flap gate at its outlet. |
| **Operation & Maintenance (O&M):** | Swale detention would only need regular maintenance for its inlet / outlet works. The detention basin itself would need minimal maintenance, as vegetation and sediment can be allowed unchecked. Existing O&M activities around the swale area are expected to continue within the project limits. Typical maintenance activities include trash and debris removal, vegetation (overgrowth) removal, erosion repair in natural sections, and sediment removal will remain the same. Some additional maintenance activities would be required for floodwalls downstream of the swale for graffiti removal | Operation and maintenance of this Alternative would be minimal. Although the new section would be designed with adequate slope to move debris, the inlets would require regular cleaning to remove leaves and other debris during the flow season. Swale detention would only need regular maintenance for its inlet / outlet work. The detention basin itself would need minimal maintenance, as vegetation and sediment can be allowed unchecked. Existing O&M activities around the swale area are expected to continue within the project limits and no additional maintenance activities would be required. Typical maintenance activities include trash and debris removal, graffiti removal, vegetation (overgrowth) removal, erosion repair in natural sections, and sediment removal will remain the same. |
| **Socio-Cultural Environment:** | | |
| **(A) Land Ownership/ Access/ Right of way:** | detention basin facility would be constructed on the swale area located on the left side (looking upstream) of Calabazas Creek. Land acquisition would not be necessary. All work would occure on the existing District easemnt or fee properties. | Land acquisition would be necessary from the property owner, City of Saratoga. |
| **(B) Aesthetics:** | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. |
| **(C) Recreation Potential:** | None identified | None identified |
| **Physical Environment:** | | |
| **(A) Sedimentation** | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. |
| **(B) Water Quality** | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. |
| **(C) Geology and Soils** | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. |
| **Environmental Review:** | | |
| **(A) Biological Resources** | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. |
| **(B) Cultural Resources** | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. |
| **(D) Public Services, Utilitites and Traffic** | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. |
| **Project Costs:** | | |
| **Construction Costs** | $0.8 million | $2.5 million |

# Calabazas Creek - Summary of Feasible Alternatives for UPRR (Site 4)

| NFP Objectives | **Alt 4A** (underground RCP bypass) | **Alt 4B** (Bridge Replacement) | **Alt 4C (**floodwall) |
|---|---|---|---|
| **Alternative Description:** | An underground bypass consisting of a 84" reinforced concrete pipe (RCP) under residential backyards and the railroad tracks would be constructed. The inlet to the structure would start at a point 120-feet upstream of UPRR and go north along creek bank to a point 60-feet downstream of UPRR. | The existing 6-foot by 13-foot (average size of u/s & d/s face) single span bridge at UPRR would be demolished and replaced by a new 7-foot by 12-foot new double RCB. | Upstream of UPRR about 600-650 feet channel section would be modified by installing a floodwall approximately 7.5 feet in height along top of the existing both banks. UPRR existing single span bridge will remain the same with pressure flow under the upstream end. |
| **Operation & Maintenance (O&M):** | Operation and maintenance of the RCP would be minimal and would be designed to have adequate slope for sediment control. | Operation and maintenance activities for the double RCB at UPRR would be similar to existing bridge and would be designed to have adequate slope for sediment passage. | Most existing O&M activities are expected to continue at the same level within the project limits. Typical maintenance activities include trash and debris removal, vegetation (overgrowth) removal, erosion repair in natural sections, and sediment removal will remain the same. Graffiti problems and associated additional maintenance work may increase due to the presence of these large concrete walls. |
| **Socio-Cultural Environment:** | | | |
| **(A) Land Ownership/ Access/ Right of way:** | Construction of the underground RCP bypass along the creek bank would require flood control easements. Land acquisition would be necessary for the bypass route. Construction access easements may be necessary. | The construction work would be done within District and UPRR easements. | Land acquisition would be necessary for the construction of floodwalls on the east bank and might be necessary for the west bank as well. |
| **(B) Aesthetics:** | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. |
| **(C) Recreation Potential:** | None identified | None identified | None identified |
| **Physical Environment:** | | | |
| **(A) Sedimentation** | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. |
| **(B) Water Quality** | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. |
| **(C) Geology and Soils** | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. |
| **Environmental Review:** | | | |
| **(A) Biological Resources** | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. |
| **(B) Cultural Resources** | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. |
| **(D) Public Services, Utilitites and Traffic** | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. | To be determined during analysis of environmental impacts. |
| **Project Costs:** | | | |
| **Construction Costs** | $4.4 million | $2.2 million | $0.8 million |